

AMENDMENTS TO THE CLAIMS

The listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims

1-20. (Cancelled)

21. (New) A device for fusion splicing ends of two optical fibers to each other comprising:

retainers for optical fibers adapted to hold ends of two optical fibers with end surfaces placed at each other in a splice position;

a CO₂ laser emitting light to the splice position; and

a mirror having a curved concave surface located to deflect a collimated direct light beam emitted by the CO₂ laser towards the splice position and to make it converge to a focus in the direction of the splice position, the splice position located at a distance of the collimated direct light beam.

22. (New) The device according to claim 21, wherein said concave mirror and the retainers are adapted to make the splice position be located a relatively small distance of a focus of the collimated direct light beam as reflected by the concave mirror.

23. (New) The device according to claim 21, wherein said surface of the concave mirror being an off-axis paraboloid type.

24. (New) The device according to claim 21, wherein the emission wavelength of the CO₂ laser is substantially 9.3 μm.

25. (New) The device according to claim 21, wherein the diameter of the collimated direct laser beam emitted by the CO₂ laser is in the range of 2 to 4 mm.

26. (New) The device according to claim 21, wherein the maximum power of the CO₂ laser is in the range of 0.8 to 1 W.

27. (New) The device according to claim 21, wherein the angle with which the collimated direct light beam of the CO₂ laser is deflected by the concave mirror is in the range of 45 to 70°.

28. (New) The device according to claim 21, wherein the collimated direct light beam emitted by the CO₂ laser is focused by the concave mirror to a point located 30 to 50 mm in front of the concave mirror.

29. (New) The device according to claim 21, wherein the distance between the center of the light spot at the splice position and a center axis of the collimated direct light beam emitted by the CO₂ laser is in the range of 30-40 mm.

30. (New) The device according to claim 21, wherein the diameter of the light spot, produced by light emitted by the CO₂ laser and deflected by the concave mirror, at the splice position is in the range of 300 to 500 μm.

31. (New) The device according to claim 21, further comprising a beam damping device located to receive and absorb the light that is deflected by the concave mirror and has passed the splice position.

32. (New) The device according to claim 21, further comprising a pointing light source issuing light formed and directed to form a light beam located and formed substantially as the collimated direct light beam emitted by the CO₂ laser, being coaxial therewith and having substantially the same cross-section.

33. (New) The device according to claim 32, wherein the pointing light source comprises a laser diode emitting light in the visible range.

34. (New) The device according to claim 33, wherein the operating power of the laser diode is in the range of 5 to 10 mW.

35. (New) The device according to claim 32, further comprising a semi-transparent or semi-reflecting mirror that is placed so that the collimated direct light beam emitted by the CO₂ laser passes the mirror and that directs light from the pointing light source to become coaxial with the collimated direct light beam.

36. (New) A method of fusion splicing ends of two optical fibers to each other, comprising the successive steps of:

aligning the ends to have end surfaces near or in close contact with each other at a splice position;

forming and directing a collimated direct light beam emitted by a CO₂ laser to form a suitable spot at the splice position, the forming and directing being made by observing light emitted by a pointing light source, said light having substantially the same beam location and geometry as the collimated direct light beam emitted by the CO₂ laser; and

illuminating the splice position by the formed and directed collimated direct light beam emitted by the CO₂ laser.

37. (New) The method according to claim 36, wherein in the step of forming and directing the collimated direct light beam emitted by the CO₂ laser, the collimated direct light beam is formed and deflected by being reflected by a mirror having a concave surface of the off-axis paraboloid type.

38. (New) The method according to claim 36, wherein in the step of forming and directing the collimated direct light beam emitted by the CO₂ laser, the collimated direct light beam is formed and directed to have a focus located at a relatively small distance of the splice position.

39. (New) The method according to claim 36, wherein in the step of forming and directing the collimated direct light beam emitted by the CO₂ laser, the collimated direct light beam is formed and directed to have the spot at the splice position located at a distance of the collimated direct light beam.

40. (New) The method according to claim 37, wherein in the step of forming and directing the collimated direct light beam emitted by the CO₂ laser, the collimated direct light beam is formed and directed by being reflected by a concave mirror having a nearly paraboloid shape.

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